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PATENT APPLICATION
Mo5944
MD-00-108-PU

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION OF)	
PETER H. MARKUSCH ET AL)	GROUP NO.: 1771
SERIAL NUMBER: 09/809,604)	
FILED: MARCH 15, 2001)	EXAMINER: L. SALVATORE
TITLE: IMPROVED POLYURETHANE/ GEOTEXTILE COMPOSITE AND A PROCESS RELATED THERETO FOR THE PRODUCTION THEREOF)	

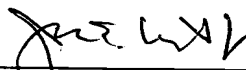
LETTER

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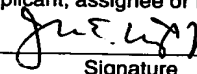
Sir:

Enclosed herewith is an Appeal Brief in the matter of the subject Appeal.
Please charge the fee for filing the Brief, \$500.00, to our Deposit Account Number
13-3848 .

Respectfully submitted

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John E. Mrozinski, Jr. Reg. No. 46,179
Name of applicant, assignee or Registered Representative

Signature
May 11, 2005
Date



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APPEAL BRIEF

Commissioner for Patent
P.O. Box 1450
Alexandria, VA 22313-1450
Sir:

The present Appeal Brief is submitted in support of the Notice of Appeal filed March 15, 2005.

I. REAL PARTY IN INTEREST

The real party in interest for the present Application Serial No. 09/809,604 is Bayer Corporation of Pittsburgh, Pennsylvania, by virtue of the assignment executed March 13, 2001.

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John E. Mrozinski, Jr., Reg. No. 46,179

Name of applicant, assignee or Registered Representative

Signature

May 11, 2005

Date

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II. RELATED APPEALS AND INTERFERENCES

On March 15, 2005, a Notice of Appeal was filed in Application Serial No. 09/809,604. There are no pending appeals or interferences of which Appellants are aware that would be affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Appellants herewith appeal the Final Rejection of Claims 2-14 and 19-32. Claims 2-14 and 19-32, are pending and stand rejected. Claims 1 and 15-18 have been canceled. A complete copy of the appealed claims is set forth in the Appendix.

IV. STATUS OF AMENDMENTS AFTER FINAL

An Amendment under 37 CFR § 1.116 was filed in this application on April 14, 2004 which resulted in the Examiner's withdrawal of the Final Rejection and institution of a new ground for rejection in the Office Action mailed May 4, 2004. No subsequent Amendment under 37 CFR § 1.116 has been filed in this application.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates to an improved polyurethane geotextile composite comprising a geotextile impregnated with an unfilled polyurethane composition comprising a reaction product of: a) a liquid polyisocyanate having an isocyanate content of at least 10% by weight and represented by the formula $Q(NCO)_n$ in which n represents a number from 2 to about 5 and Q represents an aliphatic hydrocarbon group containing from 2 to about 18 carbon atoms, a cycloaliphatic hydrocarbon group containing from 4 to about 15 carbon atoms, an araliphatic hydrocarbon group containing from 8 to 15 carbon atoms, or an aromatic hydrocarbon group containing from 6 to about 15 carbon atoms, b) an isocyanate reactive component comprising one or more high molecular weight polyether polyols having from 2 to 6 hydroxyl groups and a number average molecular weight of at least 250 to 8,000 and 0 to 10% by weight of a low molecular weight diol or triol having an equivalent weight of 31 to 99, and c) an organometallic catalyst, wherein the isocyanate reactive component b) contains no more than 0.1% by weight water prior to reaction with the liquid polyisocyanate a). (Found at least at page 4, lines 6-23; page 6, lines 16-23; and page 10, lines 1-3.)

The present invention further relates to an improved polyurethane geotextile composite comprising a geotextile impregnated with an unfilled polyurethane composition, the unfilled polyurethane composition comprising a reaction product of: a) a liquid polyisocyanate having an isocyanate content of at least 10% by weight and represented by the formula $Q(NCO)_n$ in which n represents a number from 2 to about 5 and Q represents an aliphatic hydrocarbon group containing from 2 to about 18 carbon atoms, a cycloaliphatic hydrocarbon group containing from 4 to about 15 carbon atoms, an araliphatic hydrocarbon group containing from 8 to 15 carbon atoms, or an aromatic hydrocarbon group containing from 6 to about 15 carbon atoms, b) a polyol mixture comprising: i) from 5 to 15 parts by weight of a propylene oxide adduct of an amine containing starting component, which adduct has a molecular weight of up to 1000, ii) a propylene oxide adducts of a low molecular weight organic compound having from 3 to 6 OH groups which adduct has a molecular weight of no more than 1000, iii) a propylene oxide adduct of a low molecular weight diol which adduct has a molecular weight of no more than 3000, and c) from 0.0001 to 0.05 parts by weight per hundred parts by weight of the polyol mixture of a tin catalyst. (Found at least at page 5, lines 3-21; page 6, lines 16-23; and page 10, line 30 to page 11, line 2.)

VI. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 2, 5-11 and 21 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. No. 6,187,892 issued to Markusch et al.
2. Claims 12-14, 19-22 and 25-32 stand rejected under 35 U.S.C. §103(a) as being rendered obvious by U.S. Pat. No. 6,187,892 issued to Markusch et al.
3. Claims 3, 4, 23 and 24 stand rejected under 35 U.S.C. §102(e), as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being unpatentable over U.S. Pat. No. 6,187,892 issued to Markusch et al. as applied to Claims 2 and 19.

VII. ARGUMENT

As will be set forth in detail below, Claims 2, 5-11 and 21 are not anticipated by U.S. Pat. No. 6,187,892 issued to Markusch et al. Further, Claims 12-14, 19-22 and 25-32 are not rendered obvious by U.S. Pat. No. 6,187,892 issued to Markusch et al. Finally, Claims 3, 4, 23 and 24 are neither anticipated nor rendered obvious by Mo5944

U.S. Pat. No. 6,187,892 issued to Markusch et al. as applied to Claims 2 and 19. Accordingly the rejections under 35 U.S.C. §§102 and 103, should be reversed, and favorable action by the Board is respectfully requested.

A. The Rejection under 35 U.S.C. §102(e) is Improper

Claims 2, 5-11 and 21 have been rejected under 35 U.S.C. §102(e), as being anticipated by U.S. Pat. No. 6,187,892 issued to Markusch et al. As will be set forth below, Appellants submit that Claims 2, 5-11 and 21 are not anticipated and the rejections thereof should be reversed.

1. The Examiner's Rationale

The Examiner has alleged at page 2, paragraph numbered 3 of the Final Office Action, mailed December 15, 2004, that,

Applicant argues that Markusch et al., fails to teach impregnating the polyurethane composition. Applicant points to a passage in Markusch et al., which discloses that the viscosity of the reacting adhesives are sufficiently high such that the polyurethane composition does not soak into the porous substrates and thus remain on the surface. Applicant invites the Examiner to point to where it suggested to modify the polyurethane composition such that it can be impregnated. First, the Examiner appreciates Applicant supplying a Webster's definition of impregnate and acknowledges the disclosure of Markusch et al., regarding the viscosity of the adhesives. In response to Applicant's argument, the Examiner points to the teaching of Markusch et al., which teaches placing the coated substrate face down in the desired position and exerting pressure on the uncoated side (Column 10, 40-46). Thus, while it may be that the polyurethane composition remains on the surface of the substrate after the coating, upon the application of pressure, the polyurethane composition would inherently impregnate and/or soak into any of the porous textile substrates taught by Markusch et al., (Column 10, 20-25). As such, no suggestion to modify the polyurethane composition such that is able to impregnate and/or soak into porous substrates is not (*sic*) necessary.

2. The Claimed Compositions are Patentably Distinguishable From the Cited Reference

Appellants respectfully remind the Board that as stated in MPEP §2131, to anticipate a claim, a reference must teach every element of that claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. In contradistinction

to the Examiner's speculation about the inherent teaching of the reference which is reproduced above from the Final Office Action, Markusch et al. explicitly teach that their high viscosity compositions do not soak into porous substrates and remain on the surface. Markusch et al. state at col. 2, lines 13-16, that in their invention,

The viscosity of the reacting adhesives is sufficiently high so that the compositions **do not soak into porous substrates and thus remain on the surface** of the substrate where they maintain their effectiveness as adhesive layers. (Emphasis added)

Appellants wish to point out to the Board that nowhere do Markusch et al., teach as hoped by the Examiner that the compositions do not soak into porous substrates except with the application of pressure. Appellants assert that the disclosure of Markusch et al. neither describes nor suggests impregnating the substrate with a polyurethane composition as is instantly taught and claimed. Therefore, Claims 2, 5-11 and 21 are not anticipated by U.S. Pat. No. 6,187,892 issued to Markusch et al. and the rejections thereof under 35 U.S.C. §102(e) should be reversed.

B. The Rejection under 35 U.S.C. §103(a) is Improper

Claims 12-14, 19-22 and 25-32 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Pat. No. 6,187,892 issued to Markusch et al. As will be set forth below, Appellants submit that Claims 12-14, 19-22 and 25-32 are not rendered obvious by the cited art and the rejections thereof should be reversed.

1. The Examiner's Rationale

The Examiner has alleged at page 3, paragraph numbered 5 of the Final Office Action mailed December 15, 2004 that,

The above rejection is maintained and the Applicant has not presented any new arguments for which to consider.

The Examiner has alleged at page 4, paragraph numbered 5 of the Office Action mailed May 4, 2004 that,

With regard to claims 12-14 and 29-31, Markusch et al., teaches applying the polyurethane composition to various substrates such as woven and non-woven textiles (Column 10, 20-25), but fails to teach the amount per square meter or thickness limitations, however, it would have been obvious to one having ordinary skill in the art at the time the

invention was made to optimize the amount of polyurethane coating as a function of desired impregnation and intended final use. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum of workable ranges involves only routine skill in the art. *In re Alder*, 105 USPQ 233.

With regard to the claimed amount of propylene oxide adduct recited in claims 19b) and 32b), part I, Markusch et al., fails to explicitly the claimed range of 5 to 15 parts, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the amount of amine containing propylene oxide adduct to achieve a balance of properties within the mixture. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum of workable ranges involves only routine skill in the art. *In re Alder*, 105 USPQ 233.

With regard to the molecular weight limitations set forth in claims 20 and 32, Markusch et al., fails to explicitly teach the claimed ranges, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the molecular weight of each component as a function of desired functionality (i.e., viscosity, weight) and intended end use. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617,617 F2d 272, 205 USPQ 215.

With regard to the amount of tin catalyst used as set forth in claim 19 Markusch et al., does teach a tin comprising catalyst (Column 9, 15-20), but fails to explicitly teach the claimed ranges, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the amount of catalyst used to facilitate the reaction. . It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617,617 F2d 272, 205 USPQ 215.

The recited intended use of a geotextile in the preamble is not given patentable weight at this time since the prior art meets the structural and chemical limitations. The reference teaches applying the polyurethane composition as uniform layer to a variety of textile substrates. As such, since the Applicant fails to set forth the structure limitations of the geotextile it is the position of the Examiner that a non-woven comprising said polyurethane coating could function in the desired capacity of a geotextile. The burden is upon the Applicant to evidence the contrary.

2. *The Claimed Compositions are Patentably Distinguishable From the Cited Combination of References*

Appellants dispute the Examiner's statement reproduced above from the Final Office Action that they did not present any new arguments in response to the present rejection. Appellants argued at page 11 of the Response submitted September 7, 2004 that,

Clearly there is no such teaching, suggestion or motivation shown in the reference in this case to modify a polyurethane composition that will not soak into a porous surface into one which will impregnate a geotextile. If the Examiner is relying on knowledge generally available to one of ordinary skill in the art, MPEP §2144.03 states that if applicants traverse such an assertion, the Examiner should cite a reference in support of her position. Applicants do traverse the Examiner's assertion in the case and hereby request such a reference. If the Examiner is relying on facts within her personal knowledge, applicants respectfully request and are calling for, pursuant to MPEP §2144.03 and 37 C.F.R. §1.104, the Examiner to support such facts by an Affidavit.

If the Examiner continues to maintain her rejection, applicants respectfully request she point with particularity to those portions of Markusch et al. which indicate modifying their polyurethane composition which will not soak into a porous surface into one which will impregnate a geotextile. Applicants have found no such teaching in Markusch et al. It is well established that a reference which does not recognize a problem can not suggest a solution. *In re Shaffer*, 108 USPQ 326 (CCPA 1956).

Appellants note that the Examiner has failed to provide the requested reference or affidavit or point with specificity to those portions of Markusch et al., which teach or suggest as she asserts.

As stated in MPEP §2143.01, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, citing *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992).

Although Markusch et al. may teach applying a coating to a substrate as argued by the Examiner, they neither describe nor suggest impregnating a geotextile

with a polyurethane composition. There is simply no teaching or suggestion in Markusch et al., to use a polyurethane with a lower viscosity than what Markusch et al. teach to fill, imbue, saturate, i.e., to impregnate, a geotextile. It logically follows that any modifications of this impregnation, as are instantly claimed, likewise cannot have been taught or suggested by Markusch et al. Thus, the cited reference fails to render obvious Claims 12-14, 19-22 and 25-32, and therefore the rejection under 35 U.S.C. §103(a) should be reversed.

C. The Rejections under 35 U.S.C. §§102(e)/103(a) over Markusch et al. are Improper

Claims 3, 4, 23 and 24 have been rejected under 35 U.S.C. §102(e), as being anticipated by, or in the alternative as rendered obvious, under 35 U.S.C. §103(a) by U.S. Pat. No. 6,187,892 issued to Markusch et al. As will be set forth below, Appellants submit that Claims 3, 4, 23 and 24 are neither anticipated, nor rendered obvious, by Markusch et al., and the rejections thereof should be reversed.

1. The Examiner's Rationale

The Examiner has alleged at page 3, paragraph numbered 7 of the Final Office Action mailed December 15, 2004 that,

The above rejection is maintained and the Applicant has not presented any new arguments for which to consider.

The Examiner has also alleged at page 6, paragraph numbered 7 of the Office Action mailed May 4, 2004 that,

With regard to the NCO:OH equivalent ratio limitations set forth, although Markusch et al., does not explicitly teach the claimed ratios, it is reasonable to presume that said property is inherent to the invention of Markusch et al. Support for said presumption is found in the use of like materials (i.e., poly(phenylisocyanate), high molecular weight polyols and low molecular weight triols having the desired reactive OH groups), which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald*, 205 USPQ 594.

In addition, the presently claimed NCO:OH equivalent ratio's would obviously been present once the Markusch et al. product is provided. *In re Best*, 195 USPQ 433.

2. The Claimed Compositions are Patentably Distinguishable From the Cited Reference

Appellants dispute the Examiner's statement reproduced above from the Final Office Action that they did not present any new arguments in response to the present rejection and the implication that an unrebutted *prima facie* case of obviousness has been made by the Examiner which would trigger the Appellants' obligation to disprove the Examiner's presumption as held in *In re Fitzgerald* and *In re Best*. Appellants argued at page 12 of the Response submitted September 7, 2004 that,

As stated above in reply to the rejections under 35 U.S.C. §102(e) and under 35 U.S.C. §103(a), Markusch et al. neither teaches nor suggests a polyurethane composition capable of impregnating a geotextile.

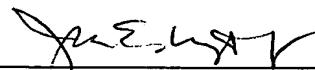
Appellants agree with the Examiner's assertion in the above-reproduced passage that the NCO:OH equivalent ratio would be present if the product of Markusch et al. was provided. However, as Appellants are not providing the product of Markusch et al., the Examiner's contention constitutes a non sequitur. As argued above, Markusch et al. fail to teach or suggest the instantly claimed invention. "Like materials" are not the standard for a rejection under 35 U.S.C. §102 as the Board is well aware. Therefore, Claims 3, 4, 23 and 24 are neither anticipated, nor rendered obvious, by U.S. Pat. No. 6,187,892 issued to Markusch et al., and the rejections thereof under 35 U.S.C. §§102(e)/103(a) should be reversed.

VIII. Conclusions

Therefore, for the reasons set forth above, the rejections of Claims 2-14 and 19-32 under 35 U.S.C. §§102 and 103 are erroneous and the Board's reversal of those rejections is respectfully requested.

Respectfully submitted,

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APPENDIX

CLAIMS ON APPEAL:

Claim 2. An improved polyurethane geotextile composite comprising a geotextile impregnated with an unfilled polyurethane composition comprising a reaction product of:

- a) a liquid polyisocyanate having an isocyanate content of at least 10% by weight and represented by the formula $Q(NCO)_n$ in which n represents a number from 2 to about 5 and Q represents an aliphatic hydrocarbon group containing from 2 to about 18 carbon atoms, a cycloaliphatic hydrocarbon group containing from 4 to about 15 carbon atoms, an araliphatic hydrocarbon group containing from 8 to 15 carbon atoms, or an aromatic hydrocarbon group containing from 6 to about 15 carbon atoms,
- b) an isocyanate reactive component comprising one or more high molecular weight polyether polyols having from 2 to 6 hydroxyl groups and a number average molecular weight of at least 250 to 8,000 and 0 to 10% by weight of a low molecular weight diol or triol having an equivalent weight of 31 to 99, and
- c) an organometallic catalyst,

wherein the isocyanate reactive component b) contains no more than 0.1% by weight water prior to reaction with the liquid polyisocyanate a).

Claim 3. The composite of Claim 2, wherein the amounts of components a) and b) are such that the NCO:OH equivalent ratio is from 1.4:1.0 to 0.9: 1.0.

Claim 4. The composite of Claim 2, wherein the amounts of components a) and b) are such that the NCO:OH equivalent ratio is from 1.1:1.0 to 1.0:1.0.

Claim 5. The composite of Claim 2, wherein the liquid polyisocyanate has an isocyanate group content of more than 20% by weight.

Claim 6. The composite of Claim 2, wherein the liquid polyisocyanate has an isocyanate group content of more than 30% by weight.

Claim 7. The composite of Claim 2, wherein the polyether polyol comprises one or more polyoxypropylene polyethers having a molecular weight of 400 to 4,000 and an average functionality of 2 to 3.

Claim 8. The composite of Claim 2, wherein the catalyst comprises a tin compound in the amount of from 0.0001 to 0.05 parts by weight per 100 parts by weight of isocyanate reactive component.

Claim 9. The composite of Claim 2, wherein the liquid polyisocyanate is an aromatic polyisocyanate.

Claim 10. The composite of Claim 2, wherein the liquid polyisocyanate is a polymethylene poly(phenylisocyanate) having an NCO-content of about 30 to 33% and a viscosity of from about 20 mPa·s to 2,000 mPa·s at 25°C.

Claim 11. The composite of Claim 2, wherein the low molecular weight diol or triol comprises 0% by weight of the isocyanate reactive component b).

Claim 12. The composite of Claim 2, wherein the amount of polyurethane per square meter of geotextile ranges from 1kg to 20 kg.

Claim 13. The composite of Claim 2, wherein the amount of polyurethane per square meter of geotextile ranges from 2kg to 5 kg.

Claim 14. The composite of Claim 2, wherein the thickness of the polyurethane geotextile composite ranges from 50 microns to about 500 microns.

Claim 19. An improved polyurethane geotextile composite comprising a geotextile impregnated with an unfilled polyurethane composition, the unfilled polyurethane composition comprising a reaction product of:

- a) a liquid polyisocyanate having an isocyanate content of at least 10% by weight and represented by the formula $Q(NCO)_n$ in which n represents a number from 2 to about 5 and Q represents an aliphatic hydrocarbon group containing from 2 to about 18 carbon atoms, a cycloaliphatic hydrocarbon group containing from 4 to about 15 carbon atoms, an araliphatic hydrocarbon group containing from 8 to 15 carbon atoms, or an aromatic hydrocarbon group containing from 6 to about 15 carbon atoms,
- b) a polyol mixture comprising:
 - i) from 5 to 15 parts by weight of a propylene oxide adduct of an amine containing starting component, which adduct has a molecular weight of up to 1000,
 - ii) a propylene oxide adducts of a low molecular weight organic compound having from 3 to 6 OH groups which adduct has a molecular weight of no more than 1000,
 - iii) a propylene oxide adduct of a low molecular weight diol which adduct has a molecular weight of no more than 3000, and
- c) from 0.0001 to 0.05 parts by weight per hundred parts by weight of the polyol mixture of a tin catalyst.

Claim 20. The composite of Claim 19 in which adduct i) of the polyol mixture has a molecular weight of from 400 to 600, adduct ii) of the polyol mixture has a molecular weight of from 600 to 800 and adduct iii) has a molecular weight of from 1,500 to 2,500.

Claim 21. A canal or ditch lined with an improved polyurethane geotextile composite which has been produced by:

impregnating a geotextile with an unfilled polyurethane composition comprising a reaction product of:

- a) a liquid polyisocyanate having an isocyanate content of at least 10% by weight and represented by the formula $Q(NCO)_n$ in which n represents a number from 2 to about 5 and Q represents an aliphatic hydrocarbon group containing from 2 to about 18 carbon atoms, a cycloaliphatic

hydrocarbon group containing from 4 to about 15 carbon atoms, an araliphatic hydrocarbon group containing from 8 to 15 carbon atoms, or an aromatic hydrocarbon group containing from 6 to about 15 carbon atoms,

b) an isocyanate reactive component comprising one or more polyether polyols having from 2 to 6 hydroxyl groups and a number average molecular weight of at least 250 to 8,000 and 0 to 10% by weight, based on total weight of b), a low molecular weight diol or triol having an equivalent weight of from 31 to 99, *and*

c) an organometallic catalyst,

wherein the isocyanate reactive component b) contains no more than 0.1% by weight water prior to reaction with the liquid polyisocyanate a),

laying the polyurethane geotextile onto a surface of a canal or ditch before the polyurethane composition has fully cured,

conforming the polyurethane geotextile to the shape of the surface of the canal or ditch, and

allowing the polyurethane composite to fully cure to form a polyurethane geotextile composite liner.

Claim 22. The composite of Claim 19, wherein the polyol mixture b) contains no more than 0.1% by weight water prior to reaction with the liquid polyisocyanate a).

Claim 23. The composite of Claim 19, wherein the amounts of component a) and polyol mixture b) are such that the NCO:OH equivalent ratio is from 1.4:1.0 to 0.9:1.0.

Claim 24. The composite of Claim 19, wherein the amounts of component a) and polyol mixture b) are such that the NCO:OH equivalent ratio is from 1.1:1.0 to 1.0:1.0.

Claim 25. The composite of Claim 19, wherein the liquid polyisocyanate has an isocyanate group content of more than 20% by weight.

Claim 26. The composite of Claim 19, wherein the liquid polyisocyanate has an isocyanate group content of more than 30% by weight.

Claim 27. The composite of Claim 19, wherein the liquid polyisocyanate is an aromatic polyisocyanate.

Claim 28. The composite of Claim 19, wherein the liquid polyisocyanate is a polymethylene poly(phenylisocyanate) having an NCO-content of about 30 to 33% and a viscosity of from about 20 mPa·s to 2,000 mPa·s at 25°C.

Claim 29. The composite of Claim 19, wherein the amount of polyurethane per square meter of geotextile ranges from 1kg to 20 kg.

Claim 30. The composite of Claim 19, wherein the amount of polyurethane per square meter of geotextile ranges from 2kg to 5 kg.

Claim 31. The composite of Claim 19, wherein the thickness of the polyurethane geotextile composite ranges from 50 microns to about 500 microns.

Claim 32. A canal or ditch lined with an improved polyurethane geotextile composite which has been produced by:
impregnating a geotextile with an unfilled polyurethane composition comprising a reaction product of:

- a) a liquid polyisocyanate having an isocyanate content of at least 10% by weight and represented by the formula $Q(NCO)_n$ in which n represents a number from 2 to about 5 and Q represents an aliphatic hydrocarbon group containing from 2 to about 18 carbon atoms, a cycloaliphatic hydrocarbon group containing from 4 to about 15 carbon atoms, an araliphatic hydrocarbon group containing from 8 to 15 carbon atoms, or an aromatic hydrocarbon group containing from 6 to about 15 carbon atoms,
- b) a polyol mixture comprising:

- i) from 5 to 15 parts by weight of a propylene oxide adduct of an amine containing starting component, which adduct has a molecular weight of up to 1000,
 - ii) a propylene oxide adduct of a low molecular weight organic compound having from 3 to 6 OH groups which adduct has a molecular weight of no more than 1000,
 - iii) a propylene oxide adduct of a low molecular weight diol which adduct has a molecular weight of no more than 3000, and
- c) from 0.0001 to 0.05 parts by weight per hundred parts by weight of the polyol mixture of a tin catalyst,
- laying the polyurethane geotextile onto a surface of a canal or ditch before the polyurethane composition has fully cured,
- conforming the polyurethane geotextile to the shape of the surface of the canal or ditch, and
- allowing the polyurethane composite to fully cure to form a polyurethane geotextile composite liner.

EVIDENCE APPENDIX

None.